RM1: State-of-the-Art Multimodality

Preparation Materials and Schedule

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11:15-13:15 daily

Contents

1 Course Overview

1.1 Vision and Objectives

This course provides an immersive, hands-on learning experience bridging theoretical understanding with practical applications in multimodal research. Students will develop skills in:

- Computational analysis of gesture-speech coordination

- Implementation of open science practices

- Application of EnvisionBOX tools for multimodal analysis

- Development of reproducible research pipelines

1.2 Prerequisites

- First year Research Master's students in Linguistics

- Basic understanding of linguistics principles

- No extensive programming experience required for general understanding of the course, but experience in python would be beneficial

2 Course Structure

Each daily session (2 hours) follows this template:

- Opening discussion & concept check (15 min)

- Core concept introduction (30 min)

- Hands-on practice (45 min)

- Group work & discussion (30 min)

3 Daily Schedule

> **Monday: Foundations & Overview**
>
> **Morning Preparation**
>
> - Installation instructions
> - Setup troubleshooting guide
>
> **Session Content**
>
> 1. Interactive Opening
>
>   - Research interest introductions
>   - Programming experience survey
>
> 2. Core Concepts
>
>   - Gesture-speech coordination examples
>   - Research case studies
>   - Tool demonstrations
>
> 3. Hands-on Introduction
>
>   - EnvisionBOX basics
>   - Environment setup
>   - Initial analysis exercise

4 Assessment and Deliverables

4.1 Daily Assignments

- Monday: Environment setup verification
- Tuesday: Basic video analysis submission
- Wednesday: Custom pipeline development
- Thursday: Research proposal draft
- Friday: Final project presentation

4.2 Grading Criteria

- Daily assignment completion (40%)
- Class participation (20%)
- Final project (40%)

5 Technical Requirements

5.1 Software Installation

- Python 3.9

- Jupyter Notebook

- EnvisionBOX platform

- Required Python packages:

  – numpy

  – pandas

  – opencv-python

  – mediapipe

6 Resources

6.1 Required Reading

1. Pouw, W., Trujillo, J. P., & Dixon, J. A. (2020). The quantification of gesture–speech synchrony: A tutorial and validation of multimodal data acquisition using device-based and video-based motion tracking.

2. Pouw, W., Dingemanse, M., Motamedi, Y., Özyürek, A. (2021). A systematic investigation of gesture kinematics in evolving manual languages in the lab.

3. Gregori, A., et al. (2023). A roadmap for technological innovation in multimodal communication research.

6.2 Online Resources

- EnvisionBOX Documentation: `https://envisionbox.org`

- Course Materials Repository

- Tutorial Videos

- Sample Datasets

7 Contact Information

- Wim Pouw: wim.pouw@donders.ru.nl

- Babajide Owoyele: babajide.owoyele@hpi.de

- Course Website: `https://wimpouw.com`

8 Appendices

8.1 Troubleshooting Guide

8.2 Code Templates

8.3 Assessment Rubrics